



Province of
British Columbia



Defining the content and boundary of a disturbance

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1 Introduction

The demarcation of a harvest disturbance is important to many programs in Ministry of Forests, for example, compliance and enforcement, market-based pricing, Provincial inventory updates, area-based allowable annual cut trials.

In BC, the Timber Harvesting and Silviculture Practices Regulation requires that licensees must report all harvest disturbances. These include the submission of a site map delineating the extent of any openings and significant internal features. This map is then used for update of the Provincial inventory, which in turn forms the basis of all Timber Supply Area timber supply analyses. The area of harvest disturbance reported under these requirements will also be used in the regulation of area-based allowable annual cuts. Compliance and Enforcement staff have used the site map to assess trespass.

In January 2003, the chief forester of BC requested an investigation of boundary definitions for harvest disturbance (Appendix 1). In brief, the terms of reference for this project are as follows⁴:

- Examine boundary definitions for various silvicultural systems including salvage.
- Assess the ability of the Ministry of Forests' corporate information systems to extract and summarize reliable information for cut control and timber supply analysis.
- Summarize the many stand and forest level area definitions for application in area-based timber supply analysis.

This report summarizes the findings of the project and provides recommendations related to the terms of reference. Section 2 of the report provides a list of area definitions currently used within the Ministry of Forests. Section 3 defines area of harvest disturbance and discusses options for measuring such an area. Section 4 examines the issues associated with the demarcation of the boundary of harvest disturbance, and proposes a universal definition for marking such boundaries. Section 5 discusses the process of regulating area-based allowable annual cuts, and how it might be accomplished with existing corporate information systems. Section 6 contains a brief conclusion.

1.1 Guiding principles

In the examination of boundary definitions, the project team followed these guiding principles:

- the boundary definition must be applicable to all silvicultural systems; and

⁴ The "Terms of reference" did not include an examination of the merits of area-based allowable annual cuts.

- in the administration of area-based allowable annual cuts, the definition must be consistent with the ability of our corporate information systems to track the data elements that comprise the definition.

2 Definitions

In BC many types of areas are reported. For clarity, the following definitions have been provided:

Cutblock	An area, in which timber is to be harvested or has been harvested, identified in a forest development plan, license to cut, cutting permit, road permit or Christmas tree permit. (This definition was amended by the <i>Forest Statute Amendment Act</i> .)
TAUP	The total area under prescription. The requirement for silviculture prescriptions has been repealed in the <i>Forest Statutes Amendment Act</i> . Reporting of TAUP is no longer required.
Gross Area	Has replaced TAUP as the term to define the total area under consideration when developing a cutblock.
NAR	The net area to be reforested. In brief, it is the portion of the cutblock that does not include: • permanent access structures; • rock or wetland, or other area that, in its natural state, is incapable of growing a stand of trees; • an area of non-commercial forest cover indicated on an operational plan where the establishment of a free growing stand is not required; and • reserves where the establishment of a free growing stand is not required. (This definition was amended by the <i>Forest Statute Amendment Act</i> .)
Total Area	• For timber supply analysis purposes, the total area of a management unit may or may not include parks and private land.

THLB	The Timber Harvesting Land Base is the total area of a management unit less: • land not managed by the licensee or the BC Forest Service; • non-forest land; • non-productive land; • areas that are environmentally sensitive; • specific geographically defined areas; and • unclassified roads, trails and landings.
Exhibit "A" Area	The area defined by the Exhibit A map that accompanies a cutting permit. This is the area proposed for timber harvesting.

In addition, the definitions (as per regulation) of the many silvicultural systems used in the Province of British Columbia are provided in Appendix 2.

3 Defining the area of harvest disturbance

3.1 Allowable annual cut and the area of harvest disturbance

Under an area-based allowable annual cut, a licensee would be awarded the right to develop a fixed amount of area from which timber may be harvested each year. The area allowable annual cut for a management unit, determined by the Chief Forester, includes only the areas within the timber harvesting land base. The area-based allowable annual cut refers to the entire area subject to harvesting under a silvicultural system, regardless of whether or not all the trees in the area are logged.

Area-based allowable annual cuts can be regulated by tracking the area of harvest disturbance. A suitable measure of the area of harvest disturbance must be consistent with the area assumed in the timber supply analysis. For example, if the timber supply analysis excluded rocks and swamps, then the measure of area of harvest disturbance must also exclude rocks and swamps.

The current allowable annual cut is based on volume harvest projections modelled in a timber supply analysis. In a timber supply analysis, reserves, non-productive, and non-commercial forest cover areas identified from the Provincial inventory are excluded from the timber harvesting land base in the net-down process. For non-productive areas that are too small to be included in the Provincial inventory, and future reserve areas of which locations have not been determined, there are no guidelines on how these areas should be accounted for in timber supply analyses. In some analyses these areas are removed from the timber harvesting land base as a percent reduction; in others these areas are kept in the land base and their impacts are accounted for by reducing yield curves. Consistent guidelines on the treatment of reserves and non-productive areas that are not included in

the Provincial inventory are needed to ensure that modelling outcomes, such as area harvested and volume per hectare, are :

- comparable to harvest statistics reported in corporate information systems, and
- comparable across management units and over time.

3.2 Options for measuring the area of harvest disturbance

A cutblock can be used as the basic unit for tracking area of harvest disturbance for regulating area-based allowable annual cut.

There are three options for measuring the area of harvest disturbance.

Option 1: the gross area of a cutblock;

Option 2: the net area to be reforested (NAR) in a cutblock;

Option 3: the gross area of a cutblock less areas excluded from the timber harvesting land base.

The gross area of a cutblock is all the area internal to the cutblock boundary. This can include:

- reserve areas, such as wildlife tree patches and riparian reserve zones;
- non-productive areas, such as rocks and swamps; and
- non-commercial forest cover areas, such as non-commercial brush.

Since reserves, non-productive and non-commercial areas do not contribute to the timber harvesting land base, the gross area of a cut block could be larger than the land base included in the timber supply analysis from which the area-based allowable annual cut was determined. Therefore Option 1 is not recommended for measuring the area of harvest disturbance.

The net area to be reforested refers only to the areas where reforestation obligations are required. This area could be smaller than the land base assumed in the allowable annual cut for the following reasons.

1. This area could exclude very small non-productive areas that can only be identified on the ground (e.g., on a site plan) but not included in the Provincial inventory as the latter is captured typically at a smaller scale.
2. This area would only include the areas from which timber was harvested. The areas on which timber was left uncut due to the type of silvicultural system used should also be included as the area of harvest disturbance.

As an example, consider a 25-hectares cutblock of which all the area is part of the timber harvesting land base. Upon ground inspection, it is found that the cutblock has a patch of

rock about 0.1 hectare in size, which is too small to be included in the Provincial inventory. The area of harvest disturbance is 25 hectares for this cublock regardless of the silvicultural system used for harvesting. The following table gives the net area to be reforested for this cutblock under various silvicultural systems scenarios.

silvicultural system	net area to be reforested
clearcut	$25.0 - 0.1 = 24.9$ ha
clearcut with a 5 ha reserve	$25.0 - 5.0 - 0.1 = 19.9$ ha
retention (10%)	$25.0 - 2.5 - 0.1 = 22.4$ ha
group selection (harvest 5 ha in total every 20 years)	5 ha
single tree selection (leaving 700 stems per hectare)	0 ha

In the single tree selection scenario, the net area to be reforested is zero because no reforestation obligation is required.

In this example, the net area to be reforested under-estimates the area of harvest disturbance for all silvicultural systems. Therefore, Option 2 is not recommended for measuring the area of harvest disturbance.

Option 3 alleviates the problems with using the gross area or net area of a cutblock as means of measuring the area of harvest disturbance. Under this option, only areas that are part of the timber harvesting land base would be considered as area disturbed. Furthermore, the entire area developed for harvesting would be measured towards area disturbed, no matter how many trees would be logged. The following examples demonstrate how Option 3 would be used.

Consider a cutblock of 26 hectares in size with the following area breakdowns.

	area (hectares)
gross area	26.0
wildlife tree patch	3.4
non-productive	0.7
Swamp	2.5

The wildlife tree patch and the swamp area are included in the Provincial inventory, and have been excluded from the timber harvesting land base.

Scenario 1:

If the non-productive area of 0.7 ha is in fact a lake and is included in the Provincial inventory, then the area of harvest disturbance is the gross area of the cutblock minus the areas of the wildlife tree patch, the lake, and the swamp.

$$\text{area disturbed} = (26.0 - 3.4 - 0.7 - 2.5) \text{ ha} = 19.4 \text{ ha}$$

Scenario 2:

If the non-productive area is actually comprised of several small patches of rock, each too small to be included in the Provincial inventory, then the 0.7 ha of area is part of the timber harvesting land base and should be counted as part of the area disturbed. The area of harvest disturbance is the gross area of the cutblock minus the areas of the wildlife tree patch and the swamp.

$$\text{area disturbed} = (26.0 - 3.4 - 2.5) \text{ ha} = 20.1 \text{ ha}$$

3.3 Recommendations

The area of harvest disturbance can be measured as the gross area of a cutblock minus areas excluded from the timber harvesting land base (for example, reserves, non-productive, and non-commercial brush).

To ensure comparable modelling outcomes across management units and over time, the following is recommended for area-based timber supply analysis:

- Remove from the timber harvesting land base all reserves and non-productive areas that can be identified from the Provincial inventory.
- Estimate the additional area needed to meet management objectives for future reserve areas, and deduct the required area from the timber harvesting land base as a percentage.
- Do not require area adjustment factors for non-productive areas too small to be included in the Provincial inventory.
- Define area harvested as the entire area subject to harvesting under a silvicultural system, regardless of whether or not all the trees in the area are removed.

4 Defining the boundary of harvest disturbance

4.1 Demarcation of harvest disturbance

Any proposed definition should be applicable to both the internal and external boundary of a harvest disturbance. Internal boundaries may be required to demarcate reserves (e.g., Wildlife Tree Patches and Riparian Reserve Zones) and non-productive areas (e.g., rock outcrops, swamps and permanent access structures). Further, the demarcation of the boundary needs to be practical for both field measurement and inventory update.

When new aerial photography is used to create a new inventory, the outer margin of the tree crowns (drip line) is used to delineate the boundary of a disturbance. In the field,

however, the boles of the standing stems that bound the disturbance are used to mark the boundary. The latter boundary definition is used for reporting obligations under the Timber Harvesting and Silviculture practices Regulation, and for Compliance and Enforcement purposes. The two to four metre discrepancy in definitions is insignificant at the scale of inventory update — at 1:20 000 scale, the width of a map line is estimated to be 12.5 metres. Therefore, for simplicity, it is proposed that the boles of the standing stems are used to mark the boundary of a harvest disturbance.

In recent years, harvest boundaries have become more irregular. The opening may extend into the surrounding forest (Figure 1), or the surrounding forest may extend into the opening (Figure 2).

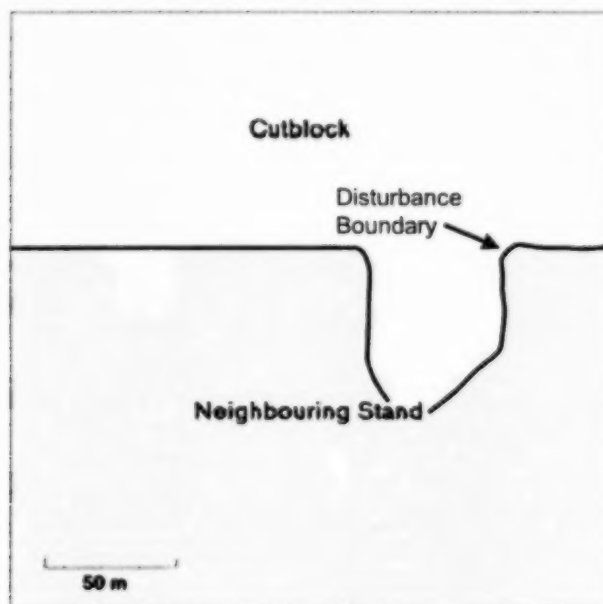


Figure 1. An example of an opening boundary protruding into a neighbouring stand and the demarcation of that irregular boundary

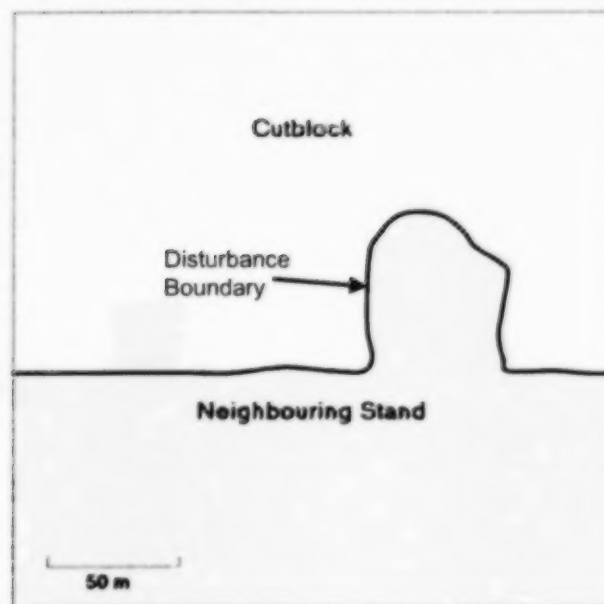


Figure 2. An example of a neighbouring stand protruding into an opening and the demarcation of that irregular boundary

Figures 1 and 2 show that an irregularity in the opening boundary would only be captured by the Provincial inventory if the area occupied by the irregularity meets or exceeds the minimum area requirement of the Provincial inventory. The current minimum area requirement for a feature to be captured by the Provincial inventory is 0.25 hectares. Note that a 0.25-hectare area within a 23-hectare opening (the 2002 Provincial average cutblock size) is comparable with the Provincial cruising tolerance of 1% to 1.5% for area error.

4.2 Recommendations

1. The boundary of a harvest disturbance is the line, which joins the trunk of the standing trees nearest to the edge of the harvest disturbance area. Interpretations for various silviculture systems are:

Clearcuts and variable retention:

A combination of marked boundary trees and unmarked trees that neighbour the outermost stumps bound the opening. Internal boundaries around reserves are demarcated in the same manner.

Single tree selection, shelterwoods and seed tree cuts:

The standing trees that neighbour the outermost stumps of the disturbance bound the opening.

Patch cuts and group selection cuts:

The standing trees that comprise the outer margins of the outermost patches form the disturbance boundary (Figure 3).

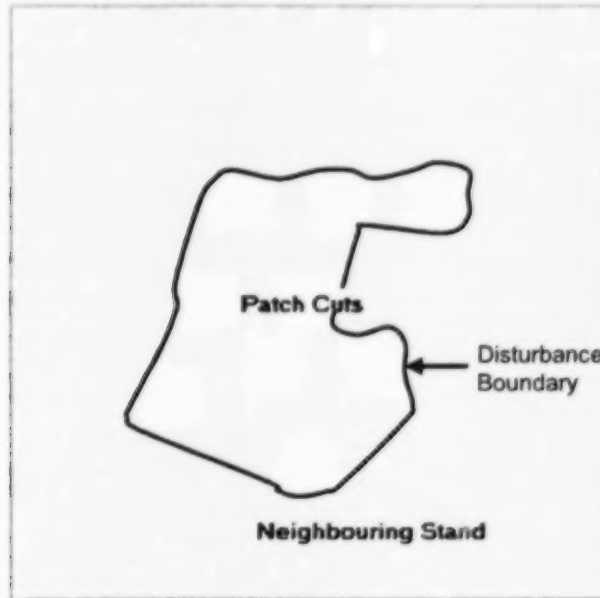


Figure 3: An example of a group of patch cuts and the demarcation of the boundary

2. An irregularity in the disturbance boundary is only mapped under the following circumstances:

Clearcuts, variable retention, single tree selection, shelterwoods and seed tree cuts:

The area occupied by the irregularity meets or exceeds the Provincial inventory mapping standard.

Patch cuts and group selection cuts:

The area occupied by the irregularity exceeds the average size of the patches that comprise the disturbance.

3. If an opening is logged over two or more years, the intermediate boundary would be mapped in the same manner as an exterior boundary described in 1 above.

5. Tracking the area of harvest disturbance

5.1 Cut-control for area-based allowable annual cut

In area-based allowable annual cut, the area of harvest disturbance is the entire area subject to harvesting under a silvicultural system. Depending on the silvicultural system used, a stand might be entered multiple times during the harvest operation. To maintain simplicity in the projection and regulation of area harvests, it is proposed (FRC and Nemus, 2002),

1. For even-aged silvicultural systems, a stand is deemed harvested at the regeneration cut.
2. For uneven-aged silvicultural systems, a stand is deemed harvested at each of the periodic selection cuts.

The regeneration cut is a harvest for the purposes of removing the old trees and creating environments favorable for establishment of regeneration (Smith et. al., 1997). The following table gives the cut-phase that corresponds to the regeneration cut under the Ministry's Silviculture Program.

even-aged systems:	cut-phase
clearcut	removal cut
clearcut with reserve	removal cut
coppice	removal cut
patch cut	removal cut
variable retention	removal cut
seed tree	establishment cut
shelterwood	establishment cut
uneven-aged systems:	
group selection	removal cut
single tree selection	recruitment cut

Therefore, the regulation of area-based allowable annual cut involves two tasks:

1. discriminate between harvests from regeneration cuts, and those that are not; and
2. for regeneration cut harvests, calculate the area of harvest disturbance as defined in Section 3.

Both of these requirements can be met using existing corporate information systems.

5.2 Corporate information systems

Currently, the *Timber Harvesting and Silviculture Practices Regulation* (December 17, 2002) details the requirements for the format and timing of silviculture reports for areas on which timber harvesting is to occur. Cutblock specific information is received in three forms:

1. Form A - Standards.
Form A identifies the standards that apply to the area contained in an operational plan. It creates a permanent record of the end results that are committed to by the licensee for a specific area. The form is submitted by May 31 for areas harvested by March 31 of the same year.
2. Form B - Activity Reporting
Form B provides the start date for silviculture obligations (initiation of harvesting) and ties back to Form A to form a permanent record of the key milestones by which specific results must be achieved. It identifies, among other information, area harvested, harvest start and end dates, and silvicultural system used. The form is submitted by May 31 for areas where harvesting or silviculture treatments have occurred by March 31 of the same year.
3. Form C - Forest Cover and Declarations
Form C identifies forest cover after completion of harvesting, at the time of regeneration and at free growing. It records the achievement of key obligation milestone dates by industry and BC Timber Sales. The form is submitted upon completion of harvest, when regeneration has been established, and at time of free growing.

At specified time periods, the form will be accompanied by an accurate map of the cutblock showing (among other features):

- areas occupied by roads and landings
- areas of rock, wetland or others areas not capable of being stocked
- areas of non-commercial forest cover
- reserves not requiring the establishment of a free growing stand
- reserves and wildlife trees patches within and adjoining the cutblock

The information submitted in Forms A, B, and C is currently stored in the corporate information systems (*Integrated Silviculture Information System, ISIS*). The next generation data base - *Reporting Silviculture Updates and Land status Tracking System (RESULTS)* - will have the capability to electronically capture and display the associated spatial (mapping) information as well. The target date for RESULTS implementation is August 1, 2003.

Both ISIS and RESULTS include attributes required to track silvicultural obligations and document the state and timing of harvesting activities in support of area-based cut control.

Determination of the type of harvest

Form B contains the silvicultural system and the cut phase used for harvesting within a cutblock. The silvicultural system codes together with the cut phase code can be used to determine if a harvest is a regeneration cut. The following table shows the code combinations that identify regeneration cuts for various silvicultural systems.

Silvicultural System	System Code	Cut Phase Code
clearcut	CLEAR	REMOV
clearcut with reserve	CCRES	REMOV
coppice	COPPI	REMOV
patch cut	PATCT	REMOV
variable retention	RETEN	REMOV
seed tree	SEEDT	ESTAB
shelterwood	SHELT	ESTAB
group selection	SELEC	REMOV
single tree selection	SELEC	RECRU

Calculation of the area of harvest disturbance

The area of harvest disturbance is the gross area of a cutblock minus areas excluded from the timber harvesting land base. The gross area of a cutblock or a portion of the cutblock harvested in the previous fiscal year is reported in Form B. The areas of various features within the gross area are reported in Form C. Therefore, the area of harvest disturbance can be calculated by taking the gross area reported in Form B and subtracting from it the areas in Form C that are not part of the timber harvesting land base.

Harvest can also occur under a road permit to make an access structure. Under the *Forest Road Regulation*, the area of this harvest disturbance must be reported. At this time, the form and manner of such reporting has not been specified. Further discussions are planned between Resource Tenure and Engineering Branch and Forest Practices Branch to integrate reporting requirements for roads within the Ministry's corporate information systems.

5.3 Data Reliability

The corporate information system ISIS supports the management, planning and activity scheduling of ministry and licensee openings. In November 2000, Internal Audit & Advisory Services (Ministry of Finance, Office of the Comptroller General) conducted a

review of the integrity of the major licensee silviculture data within the data base⁵. An assessment of business processes, data management and systems functionality was undertaken, field (site) inspections were excluded. The review found that business process and application improvements were needed to enhance data integrity.

Improvements recommended include:

- district staff need guidance and adequate processes for ensuring all data is received and correctly captured in ISIS;
- district staff require additional training on the use of ISIS and to ensure data management responsibilities are understood;
- data entry needs to be less time consuming;
- data common in the Forest Tenure Administration System and ISIS should always agree, e.g., number of hectares within an obligation;
- a data quality review function should be implemented to provide assurance on data reliability

The development of RESULTS and its associated infrastructure will address many, if not all, of the issues outlined above through the following business process changes:

- district staff will not be required to do data entry;
- RESULTS will have fewer data entry screens;
- Forms A, B, and C will be submitted electronically in a standardized format;
- submissions will be tracked electronically;
- opening information can be viewed, edited and reported on the web; and
- spatially referenced digital maps can be submitted electronically.

5.4 Recommendations

The ISIS and RESULTS data bases contain information required to track the area of harvest disturbance within a cutblock. Further testing of these systems is needed to determine the procedures for extracting information for cut-control and allowable annual cut determinations.

A robust data base with good data integrity is essential to the success of area-based allowable cut trials and other Ministry programs. We therefore recommend the following enhancements to the silviculture reports:

1. Provide guidelines on how to determine the gross area of an incompletely harvested cutblock.
2. Streamline the codes used in Forms A, B, and C to simplify data entry.

⁵ Final Report on Major Licensee Silviculture Data Integrity Review, November 2000

3. Provide clear definitions for the codes used in Form A, B, and C to improve data quality and consistency.
4. Allow the entry of harvests under road permits to improve efficiencies in data management.

6 Conclusion

In this project, we have defined the content of a harvest disturbance as required for successful implementation of area based allowable annual cut trials and have provided guidelines on how to demarcate the boundary of a cutblock. The proposed definitions and guidelines would provide consistency across the Ministry of Forests many business areas. Furthermore, the data elements that define the content of the disturbance can be tracked by the Ministry's corporate information systems. We hope this report will be helpful to those people currently revising forest policy in BC.

References

- Ministry of Forests. 1995. Silvicultural Systems Guidebook. Victoria, BC
- Ministry of Forests. 1995. Boundary Marking Guidebook. Victoria, BC
- Smith, David M, B. C. Larson, M.J. Kelty, and P.M. Ashton, 1997. The Practice of Silviculture: Applied Forest Ecology. Ninth Edition. John Wiley and Sons, New York.
- Ministry of Forests. 1998. Provincial Guide for the Submission of Timber Supply Analysis information packages for Tree Farm Licences. Timber Supply Branch. Victoria, BC
- Ministry of Finance, Internal Audit & Advisory Services. November 2000. Final Report on Major Licensee Silviculture Data Integrity Review - Ministry of Forests. Victoria, BC.
- Ministry of Forests. 2001. Ministry of Forests Procedures and Guidelines for Operational Forest Resource Survey and Mapping Using Global Positioning System Technology. Resources Inventory Committee. Victoria, BC
- FRC and Nemus, unpublished report, 2002. Area-based Allowable Annual Cut Determination - Recommended Information Requirements for Tree Farm Licences.
- Ministry of Forests. Consolidated to December 17, 2002. Cruising manual. Revenue Br., Victoria, BC
- Ministry of Forests. Consolidated to December 17, 2002. Forest Road Regulation. Victoria, BC
- Ministry of Forests. Consolidated to December 17, 2002. Operational Planning Regulation. Victoria, BC
- Ministry of Forests. Consolidated to December 17, 2002. Timber Harvesting and Silviculture Practices Regulation. Victoria, BC
- Ministry of Forests, Forest Practices Branch, unpublished report. January 2003. Discussion Document: Reporting Requirements Under Bill 75 and the Timber Harvesting and Silviculture Practices Regulation. Victoria, BC.

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Dona Stapley	Robson Valley District
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Gary Townsend	Timber Supply Branch
Dave Waddell	Timber Supply Branch
Charlie Western	Resource Tenure and Engineering Branch
Ralph Winter	Forest Practices Branch

**Appendix 1: Memorandum Re: Boundary definitions for
harvest disturbance**

Document attached.

Appendix 2: Silvicultural systems and other miscellaneous definitions

The following definitions are excerpted from the Operational and Site Planning Regulation⁶ of the Forest Practices Code of BC Act.

clearcut	A silvicultural system that (a) removes the entire stand of trees in a single harvesting operation from an area that is (i) 1 ha or greater, and (ii) at least 2 tree heights in width, and (b) is designed to manage the area as an even-aged stand.
clearcut with reserves	A variation of clearcutting in which trees are retained, either uniformly or in small groups, for purposes other than regeneration.
even-aged stand	A stand of trees consisting of one or two age classes.
group selection	A silvicultural system that (a) removes trees to create openings in a stand less than twice the height of mature trees in the stand, and (b) is designed to manage the area as an uneven-aged stand
minor salvage operation	(a) Timber that (i) is dead, infested with pests or otherwise damaged or that is required to be harvested to facilitate the removal of the dead, infested or damaged timber, or (ii) is required as part of a sanitation treatment, and is of a total volume not exceeding 2 000 m³, excluding the volume harvested from any road clearing width, if the road is required to facilitate the removal of timber referred to in subparagraph (i) or (ii), or (b) special forest products.
partial cutting	A silvicultural system in which only selected trees are harvested and includes (a) seed tree, (b) shelterwood, (c) single tree selection, (d) group selection, (e) retention system, and (f) clearcutting with reserves.

⁶ B.C. Reg. 107/98 Deposited April 2, 1998 (Consolidated to December 17, 2002)

patch cutting	A silvicultural system that creates openings less than one ha in size and is designed to manage each opening as a distinct even-aged opening.
permanent access structure	(a) A road, landing, pit or quarry that is (i) reasonably required to be used, or to provide access for, timber harvesting or other forest management activities, and whose continuous or periodic use will continue for a long enough time to prevent the production of a commercial crop of trees, on the area of the road, landing, pit or quarry, that will be harvestable concurrently with the crop in adjacent areas, (ii) either constructed through soil or rock that is not suitable, or that contains component materials such as ballast that are not suitable, for use in carrying out the soil rehabilitation treatments necessary to grow a commercial crop of trees, unless the structure has been identified in an operational plan as a temporary access structure, and (b) an excavated or bladed trail, or other logging trail, whose continuous or periodic use will continue for a long enough time to prevent the production of a commercial crop of trees, on the area of the trail, that will be harvestable concurrently with the crop in adjacent areas.
regeneration cut	Tree-cutting that facilitates the planting or reproduction of new trees.
retention system	A silvicultural system that is designed to (a) retain individual trees or groups of trees to maintain structural diversity over the area of the cutblock for at least one rotation, and (b) leave more than half the total area of the cutblock within one tree height from the base of a tree or group of trees, whether or not the tree or group of trees is inside the cutblock.
riparian management area	An area of a width determined in accordance with Part 8 that (a) is adjacent to a stream or wetland or a lake with a riparian class of L2, L3 or L4, and (b) consists of a riparian management zone and, depending on the riparian class of the stream, wetland or lake, a riparian reserve zone.

riparian management zone	That portion of the riparian management area that is outside of any riparian reserve zone or if there is no riparian reserve zone, that area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 8.
riparian reserve zone	That portion, if any, of the riparian management area or lakeshore management area located adjacent to a stream, wetland or lake of a width determined in accordance with Part 8.
seed tree	A silvicultural system in which selected trees are left standing after the initial harvest to provide a seed source for natural regeneration.
shelterwood	A silvicultural system in which trees are removed in a series of cuts designed to achieve a new even-aged stand under the shelter of remaining tree.
single tree selection	A silvicultural system in which age classes are created or maintained by the removal of individual trees of all size classes, uniformly throughout the stand, of individual trees of all size classes.
temporary access structure	(a) An excavated or bladed trail, (b) a main skid trail, backspar trail, corduroyed trail or similar structure that is identified in a silviculture prescription or logging plan as a temporary access structure, or (c) a road, landing, pit or quarry that is identified in an operational plan as a temporary access structure.
uneven-aged stand	a stand of trees consisting of 3 or more age classes.

File: 12800/ABAAC

January 3, 2003

To: Ralph Archibald, Director, Forest Practices Branch
Henry Benskin, Director, Research Branch
Gary Townsend, Director, Timber Supply Branch

Re: Boundary definitions for harvest disturbance

The range of definitions for boundaries demarcating harvest disturbance has become an important issue with implications for compliance and enforcement, market-based pricing, forest inventory updates, area-based AAC timber supply analysis and cut control. In order to address the issue I would like to assemble a small team to investigate and provide a summary report of their findings with recommendations to me by January 31, 2003. The terms of reference are:

- Examine boundary definitions for harvest disturbance of various silvicultural systems, including salvage, to determine whether they are consistent with the Ministry's business needs, and that where differences between definitions are warranted, information collection costs for industry and government are minimized.
- Assess the ability of RESULTS to extract and summarize reliable information for cut control purposes and for use in area-based AACs determinations, e.g. a summary of areas partially harvested.
- For application in area-based AACs, summarize definitions of gross vs. net vs. NAR vs. TAUP and develop options and a recommendation for use in area supply analysis.



From discussions with staff, I have identified three potential candidates to comprise the team: Vera Sit, Research Branch; Val Fletcher, Forest Practices Branch; and, Barry Snowdon, Timber Supply Branch. I would also expect that they will draw on the subject area expertise of their branch colleagues from time-to-time during the project. Please confirm with me that these individuals are available and prepared to undertake the work, or suggest alternates.

for Larry Pedersen
Chief Forester

